Report Date: 05 Jun 2013

Summary Report for Individual Task
061-266-4009
Compute Position Minimum Quadrant Elevation (Min QE)
Status: Approved

Condition: Given the site to crest reported by each section in the position, piece-to-crest ranges (PCRs), the charge and fuze to be fired, a designated cannon weapon system, appropriate rapid fire tables, tabular firing tables (TFTs), graphical site table (GST) for the 105MM and 155MM Howitzer, and a requirement to compute the position minimum Quadrant. Some iterations of this task should be performed in MOPP.

Standard: Compute the minimum quadrant elevation (QE) for a new position to an accuracy of 0 mils and the minimum safe times for fuze variable time (VT) to an accuracy of 0 seconds.

Special Condition: None

Special Standards: None

Special Equipment:

Safety Level: Low

MOPP: Sometimes

Task Statements

Cue: Occupation of a position

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

Performance Steps

1. Compute minimum QE using rapid fire tables using FM 6-50, Appendix K.

a. Add site to crest (angle 1) and (angle 2) quick reference (Table K-1). The sum must be 300 mils or less to use the rapid fire tables (FM 6-50, Tables K-2 through K-7).

b. Enter the table at the PCR, and determine the elevation for the appropriate charge(s) and fuze.

c. Add angle 1 and the elevation obtained from the appropriate table. The sum is the minimum QE.

d. Review restrictions on VT fuzes. For the specific restrictions, refer to the weapon operator's manual and/or Technical Manual (TM) 43-00012-28.

2. Compute minimum QE by the manual (step by step) method.

a. Measure site to crest for angle 1.

b. Measure vertical angel for angle 2.

c. Measure complementary angle for angle 3.

d. Determine elevation for angle 4.

e. Angle 5 is a safety factor equivalent to the value of two forks (from Table F, of the appropriate TFT) for the appropriate charge at the PCR.

f. Determine the sum of angles 1 through 5.

3. Compute minimum time for fuze VT.

a. The proximity (VT) fuze is designed to arm 3 seconds prior to the time set on the fuze; however, some VT fuzes have armed as early as 5.5 seconds prior to the time set on the fuze. Because of the probability of premature arming, a safety factor of 5.5 seconds must be added to the time of flight corresponding to the PCR. Since the time on the setting ring is set to the whole second, the time is expressed up to the next higher whole second. A VT fuze is designed so that it will not arm earlier than 2 seconds during time of flight, which makes it a bore-safe fuze.

b. In a combat situation, the platoon leader determines the minimum safe time and minimum quadrant elevation at the piece-to-crest range. The QE determined for PD fuzed rounds is safe for VT fuzes if the time set is greater than the min safe time determined. If the platoon leader finds it necessary to fire a VT fuze with a time less than the min safe time, the vertical clearance for the minimum QE must be increased to ensure the fuze will not function as it passes over the crest.

c. If the projectile is to be fired with a VT fuze set at a time less than the minimum safe time, an allowance must be made for vertical clearance of friendly elements. Vertical crest clearance for M513, M514, M728 and M732 VT fuzes fired over ordinary terrain are:

WEAPON	VERTICAL CLEARANCE FOR FUZES	
.	M514/M513	M728/M732
105 MM HOWITZER	80 METERS	70 METERS
155 MM HOWITZER	100 METERS	70 METERS

d. If the projectile is to be fired over marshy or wet terrain the average height of burst will increase. Therefore the vertical clearance shown above should be increased by 50 percent. If the projectile is to be fired over water, snow, or ice, the vertical clearance shown above should be increased by 100 percent.

e. When a fuze setting less than the minimum safe time is fired, the minimum quadrant for the VT fuze is based on the piece-to-crest range and a greater vertical clearance as indicated in the table above.

f. If the fuze setting to be fired is equal to or greater than the minimum safe time, the minimum QE determined for fuzes quick and time applies. If the fuze setting to be fired is less than the minimum safe time, the minimum quadrant elevation determined for armed VT applies.

g. The XO min QE is compared to the minimum range line as computed by the FDC. The greater of these two values is placed on the safety -T.

4. Report the greatest minimum QE and time.

a. Once the Battery/platoon has occupied the new position area the howitzer section chief begins the process of orienting the gun in the azimuth of fire and conducting the necessary checks that will result in the development of the howitzer section chiefs report (DA Form 5969 R). This report will be forwarded to the fire direction center and should contain the following information: howitzer number, azimuth of lay, lay deflection, site-to-crest, piece-to-crest range, max QE, left and right limits, propellant temperature and updated ammunition count (rounds, fuzes, powders and primers).

b. The Battery/platoon leader develops his LAMP (L-laid, A-azimuth of fire, M-min QE, P-Piece) report with information he receives from the howitzer section chief and other pertinent information from the battery/platoon Fire Direction Center (FDC then forwards this information to the Bn FDC).

NOTE: After computing the minimum QE for all of the weapons, the largest minimum QE is reported to the Fire Direction Center.

NOTE: The XO Min QE is compared to the min range line as computed by the FDC. The greater of these two values is placed on the safety-T.

(Asterisks indicates a leader performance step.)

Evaluation Preparation: Setup: Ensure that all information, references, and equipment required to perform the task are available. Use the performance measures and the references to score the Soldier's performance. Brief the Soldier. Tell the Soldier what he is required to IAW the task conditions and standards.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Computed minimum QE using rapid fire tables.			
a. Determined angle 1.			
b. Added Angles 1 and Angle 2.			
c. Sum is 300 or less. Used rapid fire tables.			
d. Using tables K-8 through K-16, entered the appropriate table with the appropriate fuze and propellant type.			
e. Extracted elevation at the appropriate charge and piece-to-crest range.			
f. Added Angle 1 to minimum elevation.			
2. Computed minimum QE by the manual method.			
a. Angle 1: Recorded the angle of site reported by the chief of section.			
b. Angle 2: Determined the vertical clearance in mils.			
c. Angle 3: Determined comp site.			
d. Angle 4: Determined elevation for PCR (TFT, Table F, column 2).			
e. Angle 5: Determined the value of 2 forks (TFT, Table F, column 6).			
f. Added angles 1-5 to determine minimum QE elevation.			
3. Computed minimum time for fuze VT using rapid fire tables. Using table K-3, K-4, K-6, K-7, K-10 through K-12, entered the appropriate table.			
4. Reported the largest minimum QE and time.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	FM 6-40	Tactics, Techniques, and Procedures for Field Artillery Manual Cannon Gunnery	Yes	No
	FM 6-50	Tactics, Techniques, and Procedures for the Field Artillery Cannon Battery	Yes	No

Environment: Environmental protection is not just the law but also the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects.

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Composite Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, NBC Protection, FM 3-11.5, CBRN Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks :

Task Number	Title	Proponent	Status
06-3-5012	Establish Firing Capability (Paladin Units)	06 - Field Artillery (Collective)	Approved